

ON UROPHYLLUM WALL. (RUBIACEAE) AND ITS NEAREST ALLIES

by

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All botanists acquainted with the family *Rubiaceae* will agree that the present subdivision is far from satisfactory and that more than one of its tribes are either artificial or ill-defined or both. The genera dealt with in this paper are said to belong to the *Mussaendeae*, but the distinction between this tribe and the *Hedyotideae* as defined by BENTHAM and HOOKER f. (*Oldenlandieae* K. SCH.) rests merely on the succulence or non-succulence of the fruit and must therefore be regarded as both artificial and ill-defined: artificial, because from a morphological point of view the difference between dry and fleshy fruits is certainly not more important than that between the capsular and schizococcous fruits brought together in the first group and not more weighty than that between the various kinds of berries and drupes referred to the second; ill-defined, because the baccate fruits are sometimes dehiscent and the schizococcous ones more or less fleshy.

The absence of a sharp line of demarcation separating the dry from the fleshy fruits doubtless explains the fact that the distinction has never been rigorously applied: *Mussaenda* L., the standard genus of the tribe with fleshy fruits, at present comprises several species provided with capsules, and plants with drupaceous fruits, by BLUME rightly referred to a genus of their own, *Metabolos*, have been included by BENTHAM and HOOKER f. in *Hedyotis* L. and by K. SCHUMANN in *Oldenlandia* L. RIDLEY's genus *Pomazota* was referred to the *Hedyotideae*, because the fruit, though soft and succulent, opens at last, but it is, as I will show elsewhere, identical with *Coptophyllum* KORTH. non GARDN., which on account of its baccate fruit was put in the *Mussaendeae*. Other examples might be adduced, but these will suffice to show that the distinction is a source of confusion and should be given up as soon as possible.

If the two tribes, *Hedyotideae* and *Mussaendeae*, are united, the bulk of the genera at present included in them form a natural group characterized not only by the pluri-ovular ovary cells and the valvate

aestivation of the corolla lobes, but also by the axile or nearly axile, peltate or subpeltate placentation and by the ovoid or angular, yellowish, reddish or brown, more or less distinctly alveolate, striate or punctate seeds. Genera in which some of these characters are wanting, for instance those with a clavate or columnar placenta rising from the base of the ovary cells, and those with flattened and smooth seeds should be excluded. For a subdivision of the group the succulence or non-succulence of the fruit should not come first; characters of more importance are: the presence or absence of hairs in the corolla throat; the place where the stamens are inserted in the tube; the presence or absence of floral dimorphism; the uni- or bisexuality of the flowers; the insertion and shape of the placenta; the number of ovary cells and the presence or absence of false septa; the nature of the stipules; the position of the inflorescences etc. These characters, however, are at present but imperfectly known, and before a satisfactory subdivision can be given, the genera themselves will have to be studied in more detail.

The group of genera dealt with in this paper are characterized by simple or, rarely, shortly bilobate or bidentate stipules; axillary inflorescences; dioecious flowers: the male ones provided with a rudimentary style and the female ones, as a rule, with well-developed, but of course completely sterile staminodes; a pluri-ocular ovary; paired, at first nearly axile placentas, which however, when the fruit begins to grow out, shift towards the middle of the septa; the presence of flattened uni-cellular hairs in the corolla throat; the insertion of the stamens, and likewise of the staminodes, in or very near the throat; a glabrous style and more or less distinctly spreading stigmata, in number corresponding with the ovary cells. It comprises the genera *Urophyllum* WALL., *Pleiocarpidia* K. SCH., *Stichianthus* VAL., *Antherostele* BREM. and some others which are described below. The genus *Urophyllum* is taken here in a much more restricted sense than up to now has been customary, for several of the Asiatic species have been removed to allied genera, and the African representatives have been excluded, because they belong, as I have shown in another paper, to another circle of affinity: the majority to *Pauridiantha* HOOK f., and the rest to the allied genera: *Pamplathantha* BREM., *Stelechantha* BREM., *Commitheca* BREM., *Poecilocalyx* BREM. and *Rhipidantha* BREM. The *Pauridiantha* group differs from the *Urophyllum* group in the dimorphic bisexual flowers; the presence of false septa in the upper part of the ovary cells; the solitary, cordate, persistently axile placentas; and the often almost completely fused, or, if free, at any rate never spreading

stigmata. In *Pauridiantha* itself, in the nearly allied *Pamplethantha* and in *Stelechantha* there are moreover but two ovary cells and two stigmata, a number never met with in the *Urophyllum* group. Further *Pauridiantha* and its allies are confined to Africa, whereas the *Urophyllum* group is at home in Tropical Asia and New Guinea. It is best developed in the Malay Archipelago, the greatest density of species being found in Borneo.

The plants belonging to the *Urophyllum* group are as a rule small and short-living, but little branched and sparsely leafy trees occurring in the undergrowth of the forest. Some of them are hardly more than one or two metres high, but even if they reach a height of twenty metres they make with their thin stems, their wide-spread divaricate branches and sparse leaves but a frail impression.

The leaves are always petiolate, and the petiole is, as a rule, laterally compressed and more or less deeply canaliculate; the blade is always acuminate or caudate, and the midrib usually canaliculate. In shape and nervation they are often very similar to those found in the genus *Lasianthus* JACK. The resemblance between the latter and the genera of the *Urophyllum* group is, moreover, not confined to the leaves, but appears also in the axillary inflorescences, in the bearded corolla throat and in the pluri-locular ovary. As *Lasianthus*, however, is easily recognizable by its solitary ascending ovules, the similarity has but seldom led to confusion. Apart from *L. tobingensis* MIQ., which, as I will show below, belongs to the new genus *Leucolophus* BREM., no species appear to have been assigned to the wrong group. In the herbaria and especially among the indeterminata provisionally referred either to *Lasianthus* or to *Urophyllum* the confusion on the other hand is often astounding. Well-trained collectors, however, err but seldom, for *Lasianthus* is in the living state easily recognizable by the disagreeable smell which the leaves and shoots emit when bruised, and by its blue drupes; in the *Urophyllum* group there is no such smell, and the fruits are white, yellow, orange or red berries. The leaves of the genus *Antherostele* differ from those of all the other genera of the *Urophyllum* group by the presence of acaridomatia.

The stipules are always interpetiolar and usually simple; in the genus *Pleiocarpidia* however they are shortly bilobate or bidentate. In the axil they are provided with silky hairs and colleters.

The inflorescences are always axillary and opposite, and vary from trichotomously corymbose or paniculate to one-flowered. If the inflorescence is trichotomously corymbose, it is at the base of the first trichotomy always provided with a single involucrel consisting of two strongly reduced leaves and two stipules. This tetra-

merous involucl is a very conservative element, for it remains in its place when the corymb is condensed to an umbel; and even when the latter, as in *Stichianthus*, is reduced to a single flower, the involucl is still there. If the inflorescence is paniculate, the axis bears two involucls: one at the base of the first, and one at the base of the second ramification. In *Praravinia* the paniculate inflorescence is reduced to a fascicle consisting at the most of 13 flowers, but often reduced to one. If 13 flowers are present, they are arranged in the following way: two decussate triads in the axil of the first involucl, two triads in the axil of the second, and a solitary terminal flower. By a reduction of the triads to single flowers, the number of flowers in the fascicle sinks to 5. A further reduction is effected by the disappearance of the two lower flowers, and when the second pair go the same way, the terminal flower alone is left. Here too the involucls show the same conservative nature as in the inflorescences of the corymbose type, for even if the inflorescence is reduced to a single flower, both involucls persist.

Superposed inflorescences are very common in the group. In some species of *Urophyllum*, for instance, not rarely three or four inflorescences are found above each other. Nowhere, however, they offer such a curious spectacle as in the genus *Stichianthus*, where they extend over the whole length of the internode. The phenomenon has been studied here first by VALETON and afterwards more in detail by WINKLER. Both authors overlooked the very small involucl at the base of the pedicel, and mistook the one-flowered inflorescences for axillary flowers.

Bracts and bracteoles are, as a rule, either absent or but weakly developed. When present, the bracts are not rarely shifted up on the branchlets and pedicels which they are supposed to subtend.

The flowers are always unisexual, and each individual bears but one kind, the sexes being rigorously separated. The female flowers, however, have repeatedly been mistaken for bisexual ones, because they are, as a rule, provided with staminodes that apart from the somewhat smaller size and the complete sterility of the anthers look exactly like normal stamens. KORTHALS tells us that in *Praravinia densiflora* KORTH. the upper part of the crown bears „as a rule” male flowers, and the lower branches female ones, but this is doubtless a mistake. J. and M. S. CLEMENS often collected a very large number of flowering shoots from the same tree, and if KORTHALS was right, this abundant material would doubtless, at least in some instances, reveal the presence of both sexes, but this is not so: the

branches collected under the same number are always of one sex only. The fact that KORTHALS' own material comprises both male and female branches, proves nothing, for we know from his own account that the specimens were collected in at least two different localities, and that the plant was abundant. The peculiar form of heterogamy found in *Mussaenda* L. and its nearest allies, where the female flower is longstyled, the staminodes being inserted in the lower half of the tube, and the male one shortstyled, the stamens being inserted at a higher level, is not found in the plants belonging to the *Urophyllum* group: stamens and staminodes are inserted here at the same height, in or very near to the mouth of the corolla tube.

The ovary is always pluri-locular, and the number of ovary cells is, as a rule, the same as that of the corolla lobes; in some species of *Praravinia*, however, it is about twice as large, so that here up to 16 ovary cells may be present. As each sept is provided on both sides with a placenta, and as the number of stigmata agrees exactly with the number of ovary cells, false septa are apparently entirely absent, and each cell must be taken to represent a carpel. The placentas are inserted near the centre of the ovary, but they are never completely axile, and the two placentas in each cell are never fused. By a more vigorous growth of the centripetal part of the septa, the placentas subsequently shift towards the middle of the septum, and in the ripe fruit they occupy the latter's centre. The placentas themselves are peltate, and the blade is produced in several folds in which the numerous ovules are embedded.

The calyx is either subtruncate, dentate or lobate, and the number of segments is, as a rule, the same as that of the corolla lobes; in *Praravinia* and in my new genus *Raphidura* it is, however, always smaller. In *Didymopogon*, *Leucolophus*, *Lepidostoma* and *Crobylanthe*, where the calyx is subtruncate, the number of segments is, of course, difficult to determine, but it is, as a rule, not impossible, and where one succeeds a satisfactory agreement is always found. In *Praravinia* the lobes are sometimes rather wide, and in that case they show an imbricate aestivation; the usual form of aestivation, however, is the open one.

The corolla is white, yellowish or greenish, rarely yellow or red, an dhypocrateriform or subinfundibuliform; the tube is usually of about the same length as the lobes. It is either cylindrical or somewhat urceolate or else slightly widened towards the throat, and nearly always bearded: the male flowers of some *Urophyllum* species are the only exceptions to this rule. The hairs are inserted either directly on the wall of the tube or on a protruding ring or

on separate scales; when they are inserted directly on the wall, they appear sometimes in the form of paired tufts accompanying the stamens or staminodes. The hairs themselves are unicellular and flat. In the genus *Antherostele* they are cuneate in outline and rather short; they are here moreover not confined to the corolla throat, but cover the whole inner side of the corolla lobes; in the other genera they are always confined to the corolla throat, usually much longer and never cuneate; in *Praravinia* and its nearest allies they are stiff, smooth, pointed and glossy-white; in *Urophyllum*, *Pleiocarpidia* and *Stichianthus*, on the other hand, they are rather weak, torulose or moniliform, obtuse or subobtuse, and usually yellowish. In the genus *Didymopogon* BREM. there is a second ring of hairs near the base of the tube. The lobes are usually rather thick and at the top produced in a descending tooth: in the open flower the latter, of course, is directed upwards; the aestivation is always valvate.

The stamens and staminodes are inserted at or a little below the mouth of the tube. Their filaments are short and glabrous and, as a rule, decurrent to the base of the tube. The anthers are dorsifixed, except in *Praravinia* and *Maschalocorymbus*, where they are subbasifixed. The connective is usually produced in a short apiculus, and sometimes more or less distinctly swollen at the back. The anthers of the staminodes are provided with shorter locules, and as the connective is, as a rule, less strongly reduced than the locules, it protrudes more distinctly. Whereas the anthers of the stamens are ovoid or oblong, those of the staminodes become in this way more or less deltoid. In *Antherostele* the anthers are linear and syngenesious.

The disc is pulviniform, conical or annular and not rarely on its periphery impressed by the decurrent filaments and at the top by the basal part of the anthers. When the staminodes in the female flower are less well developed than usual, there is, as a rule, a corresponding difference between the discs of the male and female flowers, those of the latter lacking the conspicuous impressions. The surface of the disc is either smooth or densely covered with white papillae.

The style is glabrous, rather thick and provided with a distinct canal; it ends in as many stigmata as there are ovary cells. In the female flower the stigmata are always well developed, along the margin and on the upper side covered with papillae or fimbriae, and either rectangularly or obliquely spreading. In the male flower the style is reduced to a small rudiment, at the top usually divided in a number of lobes.

The fruit is a white, yellow, orange or red berry, containing a

large number of seeds embedded in a slimy mass probably produced by the disintegration of the placentas. The seeds are small and ovoid, provided with a red-brown, crustaceous, deeply alveolate testa and a small embryo embedded in an endosperm, whose cells are filled mainly with oil. The alveoles of the testa are separated from each other by very thick, under the microscope finely, but very densely pitted walls.

Anatomically the presence of large cells filled with an in dried material dark red resin is noteworthy. Especially in the berries these cells are very conspicuous.

The area occupied by the group ranges from Ceylon in the west to New Guinea in the east.

A general impression of the differences existing between the various genera may be obtained by perusal of the following key.

Key to the Genera of the *Urophyllum* Group.

1. Leaves with small acaridomatia. Corolla lobes inside densely covered with short and obtuse cuneate hairs; hairs in the corolla throat similar but larger. Anthers linear and syngenesious. — Philippine Islands 1. **Antherostele** BREM.
- : Leaves without acaridomatia. Corolla lobes inside never covered with cuneate hairs, and hairs in the corolla throat never cuneate. Anthers ovoid, oblong or linear-oblong, never syngenesious. 2
2. Hairs in the corolla throat stiff, pointed, smooth and glossy-white 3
- : Hairs in the corolla throat neither stiff, nor pointed, nor smooth, nor glossy-white, but rather weak and yellowish, and at least towards the top torulose or moniliform 10
3. Hairs in the corolla throat inserted directly on the wall . 4
- : Hairs in the corolla throat inserted on an annular or on scale-like excrescences 7
4. Corolla tube not only in the throat but also at the base provided with a ring of hairs. — Sumatra . 2. **Didymopogon** BREM.
- : Corolla tube apart from the ring of hairs in the throat entirely glabrous 5
5. Inflorescences trichotomously corymbose, many-flowered. — Malay Peninsula, Sumatra, Borneo, Java.
3. **Maschalocorymbus** BREM.
- : Flowers fascicled or the inflorescence reduced to a single flower 6

6. Calyx and corolla isomerous. Inflorescence with a single involucl and reduced to a single flower. — Borneo 4. **Pravinaria** BREM.
- : Calyx and corolla heteromerous, i.e. the number of calyx segments always smaller than that of the corolla lobes. Inflorescence with two involucl and consisting of up to 13 fascicled flowers, very often however reduced to a single flower. — Borneo, Celebes and Philippine Islands 5. **Praravinia** KORTH.
7. Hairs in the corolla throat inserted on a ring 8
- : Hairs in the corolla throat inserted on scales. 9
8. Stipules inside adpressed pubescent. Flowers 9, umbellate. Calyx provided with 4 ovate-triangular lobes. — Borneo 6. **Rhaphidura** BREM.
- : Stipules inside glabrous. Flowers 5, 3 or 1. Calyx subtruncate. — Malay Peninsula, Sumatra 7. **Leucolophus** BREM.
9. One scale at the base of each corolla lobe. Inflorescence pedunculate, consisting of a terminal umbel preceded by a whorl of flowers; flowers shortly pedicellate. — Sumatra 8. **Lepidostoma** BREM.
- : Two scales at the base of each corolla lobe. Inflorescence subsessile; 3- or 1-flowered; flowers distinctly pedicellate. — Borneo 9. **Crobylanthe** BREM.
10. Inflorescence paniculate or trichotomously corymbose. Hairs in the corolla throat moniliform from the base. Stigmata cohering in a thick, centrally depressed disk. — Malay Peninsula, Sumatra, Borneo, Mindanao 10. **Pleiocarpidia** K. SCH.
- : Inflorescence either consisting of a terminal umbel preceded by a whorl of flowers, or simply umbellate, or reduced to a single flower. Hairs in the corolla throat torulose or moniliform, but in the upper part only. Stigmata not cohering in a flat disk. 11
11. Inflorescences various, sometimes a few superposed, but never arranged in a row extending over the whole length of the internode. — Ceylon to New Guinea. 11. **Urophyllum** WALL.
- : Inflorescences reduced to a single flower; always many superposed and arranged in a row extending over the whole length of the internode. — Borneo 12. **Stichianthus** VAL.

Of all the genera mentioned in the key *Urophyllum* covers by far the largest area, and comprises the greatest number of species. It is, however, less satisfactorily defined than the other ones. Among

the species occurring in the Great Sunda Islands at least two groups can be distinguished: one with inflorescences consisting of a terminal umbel preceded by a whorl, and the other with simple, sessile umbels. As the two groups differ moreover in the shape of the calyx, in the structure of the hairs inserted in the corolla throat, and in the nature of the stigmata, they may probably be regarded as generically distinct. As a large number of species, however, is as yet but incompletely known, it is not impossible that even more than two genera will have to be recognized. Before a thorough revision of these species, of which at present but a small part is available to me, has been effected, a decision is better postponed.

It can not be denied that the genera belonging to the *Urophyllum* group are nearly related, and many botanists would doubtless prefer to unite them in a single genus. It should not be forgotten, however, that we have no objective criterion to judge the value of the differences existing between the various groups, and that for deciding the question whether a group of species should be regarded as a genus or as a subgenus, practical considerations only are to be admitted, and foremost among the latter is the conviction that large genera are undesirable. If an illustration is needed, the genus *Psychotria* L. with its several hundreds of species may serve. Nobody, not even specialists in the group to which this genus belongs, can find their way in the chaotic confusion existing in this mass of often inept descriptions, and that always more new species are added finds its excuse only in the circumstance that the areas occupied by the individual species of this genus are as a rule very small, so that a species may be regarded as new when it has been found different from its allies occurring in the same area or in an area of somewhat larger, but by no means very large extent. That under these circumstances the identification of a specimen of which the origin is unknown is nearly always impossible, needs no special emphasis, and that this is a very unsatisfactory state of things is obvious.

One might argue that the result would be the same, whether a large genus was split up in a number of smaller ones or in a number of subgenera; but experience has taught us that this is not so. The genus *Psychotria* may serve again as an instructive example. The division in subgenera proposed by BENTHAM et HOOKER f. is doubtless far from exhaustive: nevertheless, if authors in describing new species had referred them to these subgenera, or in case this proved unfeasible had explained wherein their new species differed from them, a good deal of the confusion now reigning in this genus would have been obviated. As nobody however is bound to accept

the subgenera proposed by his predecessors, and as it is much easier to ignore them, references to them are extremely rare.

Of the genera mentioned in the key *Antherostele* has recently been dealt with in a separate paper (Journ. Arnold Arbor. XXI, pp. 25—31, 1940), and a monograph of the genus *Pleiocarpidia* will follow. Of the Philippine species of *Praravinia* a preliminary account has just been published (Journ. Arnold Arbor. XXI, pp. 33—34 and 41—47, 1940); it will be followed by a more detailed review of the species occurring in Borneo and Celebes. As stated above a review of the *Urophyllum* species of the Malay Archipelago and New Guinea is being prepared, but owing to lack of material can not yet be finished. The other genera, however, are dealt with below.

Didymopogon BREM. n. gen. ex affinitate *Urophylli* WALL., pilis fauce insertis rigidis acutis, neque ab annulo neque a squamis elatis ad *Maschalocorymbum* BREM., *Pravinariam* BREM., *Praraviniam* KORTH. accedens, corollae tubo ad basin annulo secundo pilorum vestito ab eis et generibus aliis ex *Urophylli* affinitate facilliter distinguendum, a *Maschalocorymbo* insuper floribus fasciculatis, a *Pravinaria* praesentia involucellorum duorum, calyce truncato, a *Praravinia* floribus distincte pedicellatis diversum.

Rami obtuse quadrangulares et quadrisulcati. *Folia* opposita et aequalia, petiolata; petiolus a latere compressus, canaliculatus; lamina satis magna, caudato-acuminata, costa canaliculata. *Stipulae* interpetiolares, simplices, lineares, obtusae, mox deciduae et cicatricem transverse oblongum relinquentes. *Inflorescentiae* axillares, parte defoliata ramorum insertae, ad fasciculos paucifloros redactae, basi involucellis duobus circumdatae, floribus pedicellatis, bracteis bracteolisque nullis. *Flores* 6- vel 7-meri, dioeci, feminei soli noti. *Ovarium* 6- vel 7-loculare, i.e. loculis tantis quanta corollae segmenta; placentae quoque loculo duae, parte centripetali dissepimentorum insertae, subpeltatae, lamina plicata ovulis numerosissimis obtectae. *Calyx* cupularis truncatus. *Corolla* breviter hypocrateriformis, tubo cylindrico ad basin annulo e pilis unicellularibus rigidis acutis composito, filamentis decurrentibus interrupto munito, fauce pilis similioribus, sed paulo longioribus dense albo-barbato, lobis valvatis. *Staminodia* fauce inserta, filamentis glabris brevibus, antheris dorsifixis sagittatis, longius apiculatis. *Discus* rugosus humilis. *Stylus* glaber crassiusculus; stigmata satis longa obtusa, matura nondum nota. *Bacca* nondum nota.

Genus adhuc monotypicum, in Sumatra endemicum.

Species unica: *Didymopogon sumatranum* (RIDL.) BREM.

1. **Didymopogon sumatranum** (RIDL.) BREM. n. comb.; *Urophyllum sumatranum* RIDL. in Journ. of Bot. LXX, p. 197 (1932). Rami novelli complanati, glabri, utroque latere bisulcati, deinde obtuse quadrangulares et quadrisulcati, 4—5 mm diam., sicc. nigricantes; veteriores teretes sulcis tamen diu persistentibus, cortice griseo-brunneo opaco vestiti. *Folia* petiolo glabro 1.5—3 cm longo; lamina elliptica, 14—18 cm longa et 6.8—8.0 cm lata, basi acuta, subcoriacea, opaca, sicc. pallide-olivacea, foliorum juniorum interdum rubescens, utrimque glabra, costa nervisque utroque latere costae 11—12 supra impressis et subtus prominentibus, venulis laxe reticulatis utrimque distinguendis. *Stipulae* 15 mm longae, carinatae, extus adpresse pubescentes. *Inflorescentiae* basi involuclis duobus extus adpresse pubescentibus circumdatae; pedicelli florum fasciculorum 3—5 mm longi. *Flores* feminei soli noti. *Ovarium* subglabrum ovoideum 3.5 mm altum. *Calyx* 3.5 mm altus, ad orem 5.5 mm diam., extus subglaber, intus glaber. *Corolla* extus ad apicem loborum vix conspicue puberula, ceterum glabra, tubo 4 mm diam., lobis 7 mm longis et 2 mm latis. *Staminodia* filamentis 2 mm longis, antheris 2.8 mm longis. *Stylus* nondum maturus 6.5 mm longus; stigmata 3 mm longa.

Hab. Sumatrae partem occidentalem.

Sumatra. Westcoast of Sumatra Res.: Singalang, BECCARI 348 K ♀ (typus); dupl. L.

Maschalocorymbus BREM. n. gen. ex affinitate *Urophylli* WALL., pilis fauce insertis rigidis acutis, neque ab annulo neque a squamis elatis ad *Didymopogon* BREM., *Pravinariam* BREM., *Praraviniam* KORTH. accedens, inflorescentiis trichotome corymbosis ab eis tamen facilius distinguendum et *Pleiocarpidae* K. SCH. similis, corolla extus glabra, pilis fauce insertis rigidis, haud moniliformibus, stigmatibus haud in discum crassum cohaerentibus, stipulis integris, intus glabris ab eo valde diversum.

Arbores parvae, dioecae. Rami obtuse quadrangulares, sulcati. *Folia* opposita et aequalia, petiolata; petiolus a latere compressus, canaliculatus; lamina satis magna, caudato-acuminata vel caudata, costa canaliculata, multinervia. *Stipulae* interpetiolares, simplices, ovato-lanceolatae, apice incrassatae, intus glabrae, axilla sericeae, mox deciduae, cicatricem transverse oblongum relinquentes. *Inflorescentiae* axillares, pedunculatae, trichotome corymbosae, ad basin trichotomiae involucllo tetramero cinctae, bracteis minutis, haud rare in ramulos egredientibus, bracteolis nullis. *Flores* 5-meri. *Ovarium* 5-loculare; placentae quoque loculo duae, parte centripetali dissepimentorum insertae, subpeltatae, lamina plicata ovulis numerosissimis

obtectae. *Calyx* cupularis, repando-dentatus vel 5-lobatus. *Corolla* breviter hypocrateriformis, fauce pilis unicellularibus applanatis, rigidis, acutis dense albo-barbata, ceterum extus intusque glabra, lobis valvatis. *Stamina* et *staminodia* fauce inserta, filamentis glabris tubo usque ad basin decurrentibus, antheris subbasifixis oblongis, connectivo angusto in apiculam producto. *Discus* conicus vel semi-globosus, glaber, apice 5-lobatus, ad peripheriam filamentis decurrentibus impressus. *Stylus* glaber crassiusculus; stigmata 5 ovata subobtusata, supra et ad marginem papillosa; *stylodium* floris masculi clavatum, apice indistincte lobatum. *Fructus* bacca globosa, lutea vel luteo-rubra, 5-locularis. *Semina* ovoidea; testa rubra, nitida, alveolata; endospermum oleagineum; embryo parvus, rectus.

Genus speciebus pluribus Peninsulam Malayensem, Sumatram, Javam, terrae Borneënsis partem occidentalem habitans.

Species typica: *Maschalocorymbus corymbosus* (BL.) BREM.

1. ***Maschalocorymbus corymbosus* (BL.) BREM. n. comb.**; *Axanthes corymbosa* BL., Bijdr. Fl. Ned. Ind., p. 1003 (1826); *Urophyllum corymbosum* (BL.) KORTH. in Ned. Kruidk. Arch. II, 2, p. 194 (1851); — *U. sericeum* RIDL. in Journ. of Bot. LXX, p. 221 (1932) p.p.

Hab. Sumatram, Javam, terrae Borneënsis partem occidentalem.

2. ***Maschalocorymbus grandifolius* (RIDL.) BREM. n. comb.**; *Urophyllum grandifolium* RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 68 (1923).

Hab. Sumatram.

3. ***Maschalocorymbus Yatesii* (RIDL.) BREM. n. comb.**; *Urophyllum Yatesii* RIDL. in Journ. of Bot. LXX, p. 220 (1932).

Hab. Sumatram.

4. ***Maschalocorymbus villosus* (WALL.) BREM. n. comb.**; *Urophyllum villosum* WALL. in Roxb., Fl. Ind. II, p. 186 (1824); — *Axanthes tomentosa* BL. ex DC., in Prodr. IV, p. 440 (1830); *Urophyllum tomentosum* (BL. ex DC.) MIQ., Fl. Ind. Bat. II, p. 224 (1857).

Hab. Peninsulam Malayensem.

Urophyllum villosum is one of the two species on which the genus *Urophyllum* was based, and as it precedes the other one, it would seem, at first view, somewhat irregular to refer it to another genus, for on account of its position it should be regarded as the standard species. A deviation of this procedure is, of course, permitted, when it can be shown that another one is more suitable. Elsewhere (Journ.

Arnold Arbor. XXI, p. 34, 1940) I have tried to show that there is in this instance an older species which has a better claim than either of the two published by WALLICH. On the former occasion the question was of academical interest only, for neither of the species was actually removed to a new genus. Now that the old genus has been split, the matter, however, has become urgent, and for this reason I will discuss the question here once again and at somewhat greater length.

The first species of the *Urophyllum* group that was recognized as generically distinct was described by BLUME in 1823 under the name *Wallichia arborea* REINW. The name *Wallichia* could not be maintained, for it had been used already in 1819 for another genus. In 1826 BLUME therefore replaced it by *Axanthes*. In doing this he overlooked however that two nearly related species had in the meantime been referred to a new genus *Urophyllum*. The identity of *Urophyllum* and *Axanthes* was first made known by BENTHAM in HOOKER's „Niger Flora" (1849) and subsequently by KORTHALS in an article published in 1851 but written several years before. The question now arises which species should be regarded as the standard: the one described by BLUME under the name *Wallichia arborea* REINW., or one of the two published by WALLICH under the name *Urophyllum*? The argument in favour of BLUME's species is that it was the first that was recognized as generically distinct; the argument in favour of the two other species that for them the genus *Urophyllum* was created. The latter argument, however, can not be regarded as a strong one, for *Urophyllum* should not have been published as a new genus but merely as a new name for an old one. As WALLICH ought to have accepted BLUME's species as the type, the claim of the latter is in my opinion the best one.

The designation of *Urophyllum arboreum* (REINW. ex BL.) KORTH. as the standard species, has also a practical advantage, for if a choice had to be made between the two species published by WALLICH, it would inevitably fall on *U. villosum*, not only because it precedes the other, but also because it is the only one whose identity is absolutely certain. The two descriptions published by WALLICH had been drawn up by JACK, but the latter's type specimens have been lost, and it is doubtful whether WALLICH had ever seen them. With regard to *U. villosum* this makes no difference, because this species is easily recognizable from the description and can not be confused with any other, but the identity of *U. glabrum* is by no means certain. WALLICH's interpretation of this species, it is true, has been accepted by most subsequent authors, but KURZ was of opinion that the description points to a species now known as

U. longifolium WIGHT, and I quite agree with him. At any rate, so long as another choice is possible, the choice of a species whose identity is not beyond dispute should be avoided. If, however, *U. villosum* was chosen, the genus would be confined to the few species referred here to *Maschalocorymbus*, and the numerous species related to *Urophyllum arboreum* should all have to be re-named. For this reason too the choice of BLUME's species is more judicious.

The various species belonging to the genus *Maschalocorymbus* are as yet but imperfectly known, and it is quite possible that their number is more considerable than the list given above would suggest. *Urophyllum sericeum* RIDL. above p.p. referred to *Maschalocorymbus corymbosus* should be regarded as a „nomen confusum”: the description has been based on at least two, but probably three different species. As the Buitenzorg material of this genus was not yet available to me, a more detailed account is better postponed.

Pravinaria BREM. n. gen. ex affinitate *Urophylli* WALL., pilis fauce insertis rigidis acutis, neque ab annulo neque a squamis elatis ad *Didymopogon* BREM., *Maschalocorymbum* BREM., *Praraviniam* KORTH. accedens, a *Didymopogone* absentia pilorum ad basin tubi insertorum, a *Maschalocorymbo* inflorescentia ad florem singulum redacta, a *Praravinia* calyce et corolla isomeris distinguendum.

Arbusculae dioecae. *Rami* obtuse quadrangulares. *Folia* opposita et aequalia, petiolata; petiolus brevis, vix conspicue canaliculatus; lamina angusta, apicem versus attenuata. *Stipulae* interpetiolares, simplices, lineares, intus glabrae, axilla longe-sericeae, cicatricem linearem relinquentes. *Inflorescentiae* axillares, solitariae in axillis, ad florem singulum, breviter pedicellatum, basi involucello tetramero et interdum bracteolis duabus linearibus circumdatum redactae. *Flores* feminei soli noti, 5- vel 6-meri. *Ovarium* 5- vel 6-loculare; placentae quoque loculo duae, parte centripetali dissepimentorum insertae, subpeltatae, lamina plicata ovulis numerosissimis obtectae. *Calyx* fere usque ad basin in lobos ovato-lanceolares divisus vel in lobos lineares sinibus latioribus separatos productus, corollae isomerus. *Corolla* breviter hypocrateriformis, tubo cylindrico fauce solo pilis applanatis unicellariis rigidis acutis dense albo-barbato, lobis valvatis. *Staminodia* fauce inserta, filamentis malleiformibus, tubo usque ad basin decurrentibus, antheris dorsifixis, connectivo in apiculum producto. *Discus* pulviniformis, minutissime papillosus, staminodiis haud distincte impressus. *Stylus* brevis; stigmata 5—6

minute papillosa. *Fructus* bacca globosa alba, 5- vel 6-loculare. *Semina* ovoidea; testa rubro-brunnea, nitida, alveolata; endospermum oleagineum; embryo parvus, rectus.

Genus speciebus duabus terram Borneensem habitans.

Species typica: *Pravinaria leucocarpa* BREM.

The generic name is an anagram of *Praravinia*, and has been chosen because of the resemblance between the two genera.

1. *Pravinaria leucocarpa* BREM. n. spec.; typus: J. et M. S. CLEMENS 28176 in herbario lugdunensi.

Arbuscula 1.80 m alta. *Rami* novelli subcomplanati, dense villosi, deinde obtuse quadrangulares, adpresse pubescentes, 1.5 mm diam.; veteriores indumentum diu retinentes. *Folia* petiolo dense pubescente, 2—7 mm longo; lamina lanceolata vel lineari-lanceolata, 3.5—7.5 cm longa et 1.2—2.5 cm lata, apicem versus attenuata, basi subacuta vel acuta, subcoriacea, opaca, sicc. haud conspicue decolorata, foliorum novellorum tamen brunnescens, primum margine, costa utrimque, nervis subtus dense villosis, deinde adpresse pubescentibus, nervis utroque latere costae 8—10 supra prominulis, subtus prominentibus, venulis densius reticulatis subtus prominulis. *Stipulae* 9 — 12 mm longae et 1 mm latae, extus dense pubescentes. *Inflorescentiae* pedunculo usque ad 2 mm longo munitae; involuclum tetramerum e squamis ovato-lanceolatis 5 mm longis, intus glabris compositum; pedicellus usque ad 2 mm longus; bracteolae 2 lineares vel nullae. *Flores* 5- vel 6-meri; feminei soli noti. *Ovarium* 5- vel 6-loculare, dense villosum, 2.2 mm altum, 3.5 mm diam. *Calyx* 5- vel 6-merus, fere usque ad basin in lobos ovato-lanceolatos 5 mm longos et 2 mm latos divisus, tubo 0.4 mm longo. *Corolla* 5- vel 6-mera, tubo extus glabro, lobis extus dense villosis, intus glabris, 2.2 mm longis et 1.1 mm latis. *Staminodia* filamentis malleiformibus 0.7 mm longis, antheris apiculo triangulari 0.4 mm longo comprehenso 1.0 mm longis. *Stylus* brevis; stigmata 5—6 minute papillosa, 1.2 mm longa. *Bacca* globosa, 8 mm diam., pubescens, calyce paulum accrescente coronata, 5- vel 6-locularis.

Hab. terrae Borneensis partem septentrionalem.

Borneo. British North Borneo; Mt Kinabalu, Tenompok, alt. 1500 m, J. et M. S. CLEMENS 26744 L♀, id. 27913 L, BZ, A♀, id. 28716 L♀ (typus); above 1800 m, id. 28176 a L♀.

2. *Pravinaria Endertii* BREM. n. spec.; typus: ENDERT 3980 in herbario horti bogoriensis.

Arbuscula 1 m alta. *Rami* novelli subcomplanati, dense ferrugineo-villosi, deinde subquadrangulares et sparse adpresse pubescentes,

2.5—3 mm diam.; veteriores glabrescentes et cortice brunneo opaco vestiti. *Folia* petiolo dense pubescente 2—6 mm longo; lamina lanceolata 5.5—9 cm longa et 1.7—2.5 cm lata, caudato-attenuata, basi acuta, herbacea, opaca, sicc. supra badia et subtus dilute brunnea, margine, costa utrimque et nervis subtus primum dense ferrugineo-villosis, deinde sparse villosis, nervis utroque latere costae 7—9 subtus prominentibus, venulis paucis. *Stipulae* 2 cm longae et 2.5 mm latae, extus sparse pubescentes. *Inflorescentiae* ignotae. *Bacca* pedicello 6—8 mm longo, basi involucellato elata, globosa, 9 mm diam., sparse pubescens, 5-locularis, calycis lobis 5 linearibus coronata.

Hab. terrae Borneënsis partem orientalem.

Borneo. S. and E. Division; West Kutei, summit of G. Kemul, alt. 1850 m, ENDERT 3980 BZ (typus) fr. 13 Oct. 1925.

Differs from the preceding species in the somewhat thicker branches, thinner, in herbarium material very conspicuously discoloured leaves, larger stipules, a different calyx, and berries provided with a longer pedicel.

Rhaphidura BREM. n. gen. ex affinitate *Urophylli* WALL., pilis fauce insertis rigidis acutis, ab annulo elatis ad *Leucolophum* BREM. accedens, stipulis ovato-lanceolatis, intus dense adpresse pubescentibus, calyce et corolla heteromeris, calycis lobis 4 ovato-triangularibus, inflorescentiis longius pedunculatis, floribus umbellatis longe pedicellatis ab eo valde diversum.

Rami obtuse quadrangulares. *Folia* opposita et aequalia, petiolata; petiolus haud profunde canaliculatus; lamina subito in caudam angustissime linearem contracta, multinervia. *Stipulae* interpetiulares, simplices, ovato-lanceolatae, acutae, intus dense adpresse pubescentes, axilla sericeae, cicatricem subquadratum relinquentes. *Inflorescentiae* axillares, haud superpositae, breviter pedunculatae et umbellatae, involucello tetramero singulo cinctae, ebracteatae et ebracteolatae. *Flores* dioeci, masculi soli mihi noti. *Ovarium* inde mihi ignotum; rudimentum ovarii flore masculino 5- vel 6-loculare. *Calyx* tubo urceolato, lobis 4 late ovato-triangularibus. *Corolla* breviter hypocrateriformis, 7-mera, extus sparse hirtella, tubo fauce in anulum producto, annulo pilis applanatis unicellulariis rigidis acutis dense albo-barbato, lobis valvatis. *Stamina* summo annulo inserta, filamentis glabris crassis tubo usque ad basin decurrentibus, antheris dorsifixis lineari-oblongis, basi obtuse bilobatis, connectivo crasso in apiculam producto. *Discus* pulviniformis, minutissime papillosus, ad peripheriam filamentis 7-sulcatus, centro sulcis cum aliis alternantibus impressus. *Stylus* mihi ignotus; *stylodium* floris

masculi supra discum in ramulos 5 vel 6 teretes minutissime papillosos productum. *Fructus* bacca subglobosa dicta.

Genus adhuc monotypicum, in terra Borneënsi endemicum.

Species unica: *Rhaphidura Lowii* (RIDL.) BREM.

The generic name refers to the almost needle-like tail in which the leaves are drawn out.

1. *Rhaphidura Lowii* (RIDL.) BREM. n. comb.; *Urophyllum Lowii* RIDL. in Journ. of Bot. LXX, p. 195 (1932).

Hab. terrae Borneënsis partem occidentalem (Sarawak).

Leucolophus BREM. n. gen. ex affinitate *Urophylli* WALL., pilis fauce insertis rigidis acutis, ab annulo elatis ad *Rhaphiduram* BREM. accedens, stipulis sublinearibus, intus glabris, inflorescentiis sessilibus vel breviter pedunculatis, 5-, 3- vel 1-floris, calyce subtruncato ab eo valde diversum.

Arbusculae dioecae. *Rami* obtuse quadrangulares vel subteretes. *Folia* opposita et aequalia, petiolata; petiolus a latere compressus, canaliculatus; lamina lanceolata vel lineari-lanceolata, caudata vel caudato-attenuata, costa plerumque haud distincte canaliculata. *Stipulae* interpetiolares, simplices, sublineares, subobtusae, intus glabrae, axilla sericeae, cicatricem oblongum relinquentes. *Inflorescentiae* axillares, interdum duae superpositae, plerumque foliis suffultae, interdum in intumescentiis ramorum defoliorum fasciculatae, nunc 5- vel 3-florae, nunc ad florem singulum redactae, basi involucello tetramero singulo cinctae, ebracteatae et ebracteolatae. *Flores* 5- usque ad 8-meri. *Ovarium* 5- usque ad 8-loculare; placentae quoque loculo duae, parte centripetali dissepimentorum insertae, subpeltatae, lamina plicata ovulis numerosissimis obtectae. *Calyx* cupularis margine repando-dentato vel subintegro. *Corolla* breviter hypocrateriformis, alba, extus glabra, tubo fauce in annulum producto, annulo pilis unicellulariis applanatis rigidis acutis dense albo-barbato, lobis valvatis. *Stamina* summo annulo inserta, filamentibus crassis subquadrangularibus brevibus, tubo usque ad basin decurrentibus, antheris dorsifixis oblongis, basi obtuse bilobatis, connectivo massivo in apiculam incurvatam producto. *Discus* pulviniformis vel conicus, glaber, ad peripheriam sulcatus, ad apicem foveolis cum sulcis alternantibus impressus. *Stylus* nondum notus; *styloidium* floris masculi breve, in ramulos paucos teretes dense papillosos exeuns. *Fructus* bacca globosa 5- usque ad 8-locularis. *Semina* ovoidea; testa rubro-brunnea, nitida, alveolata; endospermum oleagineum; embryo parvus, rectus.

Speciebus paucis Peninsulam Malayensem et Sumatram habitans.

Species typica: *Leucolophos macranthus* (RIDL.) BREM.

The generic name refers to the hairs in the corolla throat standing forth like a tuft of white plumes.

1. *Leucolophos macranthus* (RIDL.) BREM. n. comb.; *Urophylum macranthum* RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 69 (1923).

Hab. Sumatram (Batakland).

In the type locality two nearly related species occur, and as I have not yet found an opportunity to compare them with RIDLEY's specimens, I am unable to say which is RIDLEY's species and which the new one.

2. *Leucolophos gajoensis* BREM. n. spec.; typus: v. STEENIS 8741 in herbario horti bogoriensis.

Rami novelli valde complanati, utrimque bisulcati, glabri vel sparse villosuli, sicc. lutei, interdum minute albo-pustulati, deinde obtuse quadrangulares et quadrisulcati, 2 mm diam.; veteriores cortice dilute brunneo opaco vestiti. *Folia* petiolo marginibus piloso sed ceterum subglabro, 5—10 mm longo; lamina lanceolata 10—15 cm longa et 2.5—4.7 cm lata, caudata, basi acuta, herbacea, opaca, sicc. luteo-brunnea vel novella lutea, utrimque glabra, margine et costa subtus tamen sparsissime pilosis, costa haud canaliculata, nervis utroque latere costae 8—11 supra prominulis et subtus prominentibus, venulis dense reticulatis utrimque distinguendis. *Stipulae* 13—20 mm longae et ad basin 4—5 mm latae, carinato-costatae, extus ad basin densius, ad costam sparse, ceterum sparsissime pubescentes. *Inflorescentiae* partim axillis foliorum insertae et interdum duae superpositae, partim ex intumescentiis axillaribus ramorum defoliatorum fasciculatim orientes, casu quo semper uniflorae, alioquin interdum triflorae; pedunculus 0—5 mm longus; involucellum tetramerum in lobos lineari-lanceolatos usque ad 4 mm longos partitum; pedicelli 4—10 mm longi, florum femineorum post anthesin paulum excrecentes. *Ovarium* globosum subglabrum, 6 mm diam., 8-loculare. *Calyx* extus basin versus puberulo-pubescent, intus glaber, floris masculi 5 mm altus et 7 mm diam., floris feminei 1.5 mm altus. *Corolla* 6-mera, tubo cylindrico 5 mm longo et 5 mm diam., lobis extus ad apicem puberulis 6 mm longis et 3.2 mm latis. *Stamina* filamentis 1 mm longis, antheris 2 mm longis, connectivo in apiculam 0.4 mm longam producto; staminodia floris feminei matura nondum vidi. *Discus* 3 mm diam. et 1 mm altus. *Stylus* maturus nondum notus; *stylodium* floris masculi 2.5 mm supra discum productum et usque ad discum in ramulos 4 subclavatos

acutos, dense papillosos divisum. *Bacca* subglabra 12 mm diam. *Semina* 0.4 mm longa et 0.3 mm diam.

Hab. Sumatrae partem septentrionalem.

Sumatra. Govt. Atcheh & Dep.; Gajoland, G. Kemiri, eastern slope, alt. 1900 m, v. STEENIS 9730 BZ ♀, fr. (co-typus), ibid, alt. 1860 m, id. 9524 BZ ♂, fl. Mar.; G. Losir, eastern slope, alt. 1200—1800 m, id. 8741 BZ ♂ (typus), fl. Febr.; G. Losir, Putjuk Angasan, above Penoran, alt. 2000 m, id. 8305 BZ ♂, fl. Jan.

This species differs from *L. macranthus* and from the undescribed one from Batakland mentioned above in the peculiar yellow colour which the young leaves and branches assume in drying, and the 6- instead of 7- or 8-merous corolla.

3. *Leucolophus tobिंगensis* (MIQ.) BREM. n. comb.; *Lasianthus tobिंगensis* MIQ. in Ann. Mus. Bot. Lugd.-Bat. IV, p. 249 (1869); BOERL., Handl. II (1), p. 141 (1891).

Rami novelli pilis ferrugineis dense villosis-pubescentibus, complanatis et utrimque sulcati, deinde dense adpresse pubescentes et subteretes, 2 mm diam.; veteriores cortice brunneo opaco vestiti. *Folia* petiolo dense villosis-pubescentibus, deinde adpresse pubescentibus, 9—10 mm longo; lamina lineari-lanceolata 8.5—14 cm longa et 1.8—4.0 cm lata, plerumque circ. 12.5 cm longa et 2.8 cm lata, caudato-attenuata, basi acuta, subcoriacea, sicc. supra pallida et subtus dilute brunnea, supra glabra, costa anguste canaliculata tamen primum adpresse pubescentibus, subtus costa nervisque pilis adpressis longis dense subferrugineis-pubescentibus, inter nervos sparse villosa vel glabrescentibus, nervis utroque latere costae 10—15 subtus prominentibus, venulis subdense reticulatis ad nervos perpendicularibus, subtus prominulis. *Stipulae* 12—18 mm longae et ad basin 3—4 mm latae, extus dense villosae. *Inflorescentiae* axillis foliorum insertae, sessiles, floribus 3—5 pedicellis dense villosis usque ad 2 mm longis, plerumque tamen brevioribus munitis; involucellum tetramerum extus ferrugineo-villosum, intus ad centrum longe ferrugineo-sericeum. *Flores* 5-merae. *Ovarium* 5-loculare. *Calyx* extus griseo-villosus, floris masculis 2.5 mm altus, 4 mm diam. *Corolla* imperfecte nota, nam nondum matura, lobis 3 mm longis et 1.5 mm latis. *Stamina* antheris 1.2 mm longis, connectivo in apiculam 0.4 mm longam producta. *Discus* conicus, ad peripheriam 5-sulcatus et apice foveolis 5 impressus, 1.5 mm diam. et 0.7 mm altus, subglaber. *Stylus* nondum notus; *stylodium* floris masculis 0.7 mm supra discum productum et usque ad medium in lobos 2 vel 3 minutissime papillosos fissum. *Bacca* globosa villosa, 7 mm diam., 5-locularis.

Hab. Peninsulam Malayensem et Sumatrae partem septentrionalem.

Malay Peninsula: Johore, G. Blumuh, alt. 660 m, HOLTUM 10795 A ♂ (cotypus meus), fl. Mai.

Sumatra: Govt. Atcheh & Dep.; Tobing, JUNGHUHN s.n. L, U (typi) fr.; East Coast Govt.; Marbau, Bilah, near Bilah Pertama, RAHMAT SI TOROES 126 A et 232 A, fr.

The leaves of the Sumatran specimens have as a rule 14—15 nerve pairs; those of the Peninsular one 10—13, but otherwise they agree well.

A new description of this species has been given, because the old one is very incomplete and in several respects inaccurate. From *L. macranthus* and *L. gajoensis* this species is easily distinguishable by its better developed indumentum, its narrower and firmer leaves, and above all by its more or less glomerate, much smaller flowers; the latter being moreover 5-merous.

It is not impossible that *Urophyllum leucophloeum* RIDL. and *U. rigidum* RIDL. will prove congeneric with the species dealt with above, but these species are as yet known to me from the descriptions only.

Lepidostoma BREM. n. gen. ex affinitate *Urophylli* WALL., pilis e fauce prosilientibus rigidis acutis, a squamis elatis ad *Crobilanthen* BREM. accedens, squamis cum staminibus alternantibus, haud bis numerosioribus, inflorescentiis longe pedunculatis e capitulo terminali et verticillo compositis ab eo valde recedens.

Rami subteretes. *Folia* opposita et aequalia, petiolata; petiolus e latere compressus, canaliculatus; lamina caudata, costa canaliculata. *Stipulae* interpetiolares, simplices, anguste triangulares, intus luteo-sericeae, cicatricem transverse linearem relinquentes. *Inflorescentiae* axillares, interdum duae superpositae, longe pedunculatae, ex umbella terminali compacta et verticillo florum breviter pedicellatorum ab ea remoto compositae, verticillo et umbella utrisque involucello tetramero suffultis vel verticillo foliis magnitudine redactis suffulto. *Flores* 5- vel 6-meri, dioeci; masculi soli noti. *Ovarium* inde ignotum. *Calyx* pelviformis, margine subintegro. *Corolla* breviter hypocrateriformis, extus dense puberulo-pubescent, tubo fauce in squamas oblongos cum staminibus alternantes et pilis unicellularibus appianatis rigidis acutis dense albo-barbatas producto, lobis valvatis. *Stamina* fauce inserta, filamentis glabris, tubo usque ad basin decurrentibus, antheris dorsifixis oblongis, connectivo angusto in apiculam incurvatam parvam producto. *Discus* conicus, staminibus haud conspicue impressus, dense puberulus. *Stylus* ignotus; *stylodium* floris masculi breve, apicem versus quadrangulare et dense papillosum, indivisum. *Fructus* ignotus.

Genus adhuc monotypicum, in Sumatra endemicum.

Species unica: *Lepidostoma polythyrsum* BREM.

The generic name refers to the scales in the corolla throat.

1. *Lepidostoma polythyrsum* BREM. n. spec.; typus: YATES 1646 in herbario Arboreti Arnoldiani.

Habitus ignotus. *Rami* novelli puberuli, deinde glabrescentes, sicc. nigrescentes, conspicue brunneo- vel griseo-lineolati tamen, subteretes, 3—4.5 mm diam. *Folia* petiolo supra dense hirtello, subtus puberulo-pubescente, 7—10 mm longo; lamina oblonga 9—15 cm longa et 2.5—4.8 cm lata, caudata, basi acuta vel subobtusata, subcoriacea, opaca, sicc. olivaceo-viridis, supra obscure maculata, costa subtus nigrescente, nervis venulisque subtus rufis; costa supra dense hirtella, margine et costa nervisque subtus sparse pubescentibus, nervis utroque latere costae 11—12 supra impressis, subtus prominentibus, venulis nonnullis cum nervis alternantibus fortioribus, aliis laxe reticulatis utrimque prominulis. *Stipulae* 5—7.5 mm longae et basi 1.2—3.0 mm latae, extus griseo-pubescentes. *Inflorescentiae* ex umbella 9-flora et verticillo 6-floro compositae, puberulae; pedunculus complanatus 1.5—4.5 cm longus; umbella a verticillo internodio 0.1—2.5 cm longo separata; verticillus interdum foliis usque ad 6 cm longis, plerumque tamen sicut umbella involucello tetramero suffultus; pedicelli usque ad 2 mm longi. *Calyx* extus sparse, intus dense puberulus, 1.5 mm altus, 5 mm diam. *Corolla* tubo cylindrico 3 mm longo et 2 mm diam., squamis coronalibus 1.7 mm longis, lobis intus glabris 1.5 mm longis et 1.7 mm latis. *Stamina* filamentis 1.5 mm longis, antheris 1.2 mm longis in apiculam 0.2 mm longam exeuntibus. *Discus* 2 mm diam., 1.5 mm altus. *Stylodium* 1.4 mm supra discum productum, sparse hirtellum. *Bacca* ignota.

Hab. Sumatrae partem orientalem.

Sumatra. East Coast Govt.; Asahan, above Bandar Pulu, YATES 1646 A ♂ (typus) fl. June.

Crobrylanthe BREM. n. gen. ex affinitate *Urophylli* WALL., pilis e fauce prosilientibus rigidis acutis, a squamis elatis ad *Lepidostoma* BREM. accedens, squamis quam staminibus bis numerosioribus, inflorescentiis ad triades vel flores solitarios redactis, breviter pedunculatis ab eo facilius distinguendum.

Arbuscula dioeca. *Rami* subteretes. *Folia* opposita et aequalia, petiolata; petiolus a latere compressus, canaliculatus; lamina longe caudata, costa canaliculata. *Stipulae* interpetiolares, simplices, subulatae, curvae, extus intusque glabrae, axilla sparse sericeae, cicatricem semi-orbicularem parvum relinquentes. *Inflorescentiae* axillares,

haud rare 2 vel 3 superpositae, ad triades vel ad florem singulum redactae, sessiles, basi involucello singulo parvo circumdatae, floribus distincte pedicellatis, ebracteolatis. *Flores* 4- usque ad 6-meri. *Ovarium* 4- vel 5-loculare; placentae quoque loculo duae, parte centripetali dissepimentorum affixae, subpeltatae, lamina plicata ovulis numerosissimis obiectae. *Calyx* pelviformis, margine subintegro. *Corolla* breviter hypocrateriformis vel subrotata, extus glabra, tubo fauce in squamas lineares staminibus bis numerosiores et gemellas cum eis alternantes producto, squamis pilis unicellulariis applanatis rigidis acutis dense albo-barbatis, lobis valvatis. *Stamina* et *staminodia* fauce inserta, filamentis applanatis glabris, tubo usque ad basin decurrentibus, antheris dorsifixis lineari-oblongis, sagittatis, connectivo angusto in apiculam brevem producto. *Discus* late conicus, glaber, haud profunde sulcatus. *Stylus* glaber; stigmata 4 vel 5 filiformia, sed pilis agglutinatis densissime fimbriata, stylo subaequilonga; *stylodium* floris masculi breve, in lobos paucos exeuns. *Fructus* ignotus.

Genus adhuc monotypicum in terra Borneënsi endemicum.

Species unica: *Crobilanthe pellacalyx* (RIDL.) BREM.

The generic name refers to the dense tuft of white hairs protruding through the mouth of the corolla tube.

1. *Crobilanthe pellacalyx* (RIDL.) BREM. n. comb.; *Urophyllum Pellacalyx* RIDL. in Journ. of Bot. LXX, p. 194 (1932); — *U. Shelfordii* RIDL. l.c. p. 197.

Arbuscula glabra. *Rami* novelli subteretes, sicc. nigrescentes, 2 mm diam.; veteriores cortice obscuro vestiti. *Folia* petiolo sicc. nigrescente, 6—13 mm longo; lamina oblonga 13.5—19 cm longa et 3—6.8 cm lata, in caudam longam et angustam exeuns, basi acuta, subcoriacea, utrimque nitidula, sicc. supra olivacea, subtus violaceo-brunnea, costa et nervis plerumque nigrescentibus, costa subtus valde prominente et acutangule compressa, nervis utroque latere costae 9 quorum 7 fortioribus, subtus prominentibus, venulis laxae reticulatis utrimque sed praesertim subtus prominulis. *Stipulae* 7—8 mm longae, sicc. nigrescentes. *Inflorescentiae* masculae haud rare 2 vel 3 superpositae, triflorae vel ad florem singulum redactae; femineae solitariae vel 2 superpositae, semper ad florem singulum redactae; pedunculus sparse puberulus 1—3 mm longus; involucellum e squamis vix 1 mm longis compositum; pedicelli sparse puberuli 3—5 mm longi. *Flores* masculi 5- vel 6-meri; feminei 4- vel 5-meri. *Ovarium* ovoideum glabrum 4.5 mm diam., 4- vel 5-loculare. *Calyx* floris masculi 1.5 mm altus, floris feminei 1 mm altus, 4.5—5 mm diam. *Corolla* viridula tubo 2.5 mm longo et 4.5—5 mm diam.,

squamis coronalibus 1.7—2.5 mm longis, lobis 5 mm longis et 3 mm latis, intus glabris. *Stamina* filamentis 2.2 mm longis, antheris apiculo 0.3 mm longo comprehenso 2.5 mm longis; *staminodia* similiora, sed antheris 1.7 mm longis. *Discus* 3 mm diam. *Stylus* glaber; stigmata 4 vel 5 stylo subaequilonga; *stylodium* 0.8 mm supra discum productum, in lobos 3 acutos, vix papillosos exeuns. *Bacca* mihi ignota.

Hab. terrae Borneënsis partem occidentalem.

Borneo. Sarawak, near Kuching, HAVILAND 2965 SAR ♀ (dupl. typi), fl. Mar.; id. s.n. SAR ♂, fl. 4. IV. 93; GARAI 804 SAR ♂, fl. Apr.; NAT. COLL. SAR. MUS. 301 A ♂; SHELFORD 11627 A ♂.

HAVILAND 2965 is quoted by RIDLEY both under *Urophyllum Pellacalyx* and under *U. Shelfordii*. The type of the latter is BECCARI 1434, which I have not yet seen, but SHELFORD 11627 belongs doubtless to the same species as HAVILAND 2965. RIDLEY described the type of his *U. Pellacalyx* as masculine, but the specimen preserved in the herbarium of the Sarawak Museum is feminine, and there are some indications in RIDLEY's description too pointing to a female plant. In my opinion the female plant was described by RIDLEY under the name *U. Pellacalyx* and the male one under that of *U. Shelfordii*.

Stichianthus VAL. in Bull. Jard. Bot. Buitenzorg Sér. 3 II, p. 349, Tab. X (1920); genus ex affinitate *Urophylli* WALL., pilis fauce insertis debilibus, moniliformibus ad *Pleiocarpidium* K. SCH. et ad *Urophyllum* ipsum accedens, inflorescentiis ad florem singulum redactis, permultis superpositis et seriatim ab axilla usque ad nodum proximum porrectis ab eis faciliter distinguendum.

Arbusculae dioecae. *Rami* obtuse quadrangulares, sulcati. *Folia* opposita, aequalia, petiolata; petiolus haud profunde canaliculatus; lamina elliptica vel oblonga, acuminata vel caudato-acuminata, costa haud canaliculata, venulis ad nervos perpendicularibus. *Stipulae* interpetiolares, simplices, lineares, obtusae, intus glabrae sed basin versus longe et dense sericeae, cicatricem magnum relinquentes. *Inflorescentiae* axillares, permultae superpositae et seriatim ab axilla usque ad nodum proximum extendentes, ad florem singulum redactae, basi involucello tetramero minimo circumdatae, floribus ebracteolatis distincte pedicellatis. *Flores* 4-meri, parvi. *Ovarium* 4-loculare; placentae quoque loculo duae, parte centripetali dissepimentorum affixae, subpeltatae, lamina plicata ovulis numerosis obtectae. *Calyx* tubo brevi, lobis triangularibus cum glandulis parvis alternantibus. *Corolla* albidula vel luteola breviter hypocrateriformis, extus glabra, tubo fauce pilis unicellulariis applanatis moniliformibus debilibus,

flore femineo sparse, flore masculo sparsissime barbato, lobis valvatis, intus glabris. *Stamina* fauce inserta, filamentis glabris, antheris dorsifixis ovoideis, connectivo haud producto; *staminodia* nulla. *Discus* pulviniformis, minute papillosus. *Stylus* crassiusculus, glaber; stigmata 4 teretia, subobtusa, breviter papillosa, patentia; *stylodium* floris masculi parvum, 2-partitum. *Fructus* bacca globosa alba 4-locularis. *Semina* ovoidea; testa rubro-brunnea, nitida, alveolata; endospermum oleagineum; embryo parvus, rectus.

Genus speciebus adhuc notis duabus terram Borneensem habitans.
Species typica: *Stichianthus minutiflorus* VAL.

1. *Stichianthus minutiflorus* VAL. in Bull. Jard. Bot. Buitenzorg Sér. 3 II, p. 349, Tab. X (1920); HANS WINKLER in Planta XIII, p. 85, Fig. 1, 2 et 5, (1931); MERRILL in Mitt. Inst. allg. Bot. Hamburg VII, p. 290 (1937).

Arbuscula 2—3 m alta. *Rami* novelli dense ferrugineo-villosi, obtuse quadrangulares, sulcati, deinde olivaceo-pubescentes, 2—4 mm diam., indumentum diu retinentes. *Folia* petiolo primum dense ferrugineo-villoso, deinde olivaceo-pubescente, 7—12 mm longo; lamina elliptica 9—16 cm longa et 4—7 cm lata, basi acuta, subcoriacea, opaca, sicc. olivaceo-brunnea vel supra interdum pallescens, foliorum juniorum ferrugineo-brunnea, primum margine, costa nervisque supra densius, ceterum supra sparse ferrugineo-villosa, subtus costa nervisque densissime et longissime ferrugineo-villosa, inter nervos sparse villosa, deinde margine, costa nervisque utrimque pilis olivaceis adpresse pubescens, inter nervos utrimque glabrescens, nervis utroque latere costae 10—14 subtus prominentibus, venulis subtus prominulis. *Stipulae* 2—3 cm longae et 2 mm latae, extus dense ferrugineo-villosae. *Inflorescentiae* uniflorae basi involucello sessili, e squamis 0.3 mm longis extus villosis compositae; pedicelli 0.8 mm longi, fructu usque ad 1.6 mm accrescentes, primum hirtelli, deinde glabrescentes. *Flores* plerumque 4-meri, interdum aliqui 5-meri. *Ovarium* 0.9 mm altum et 1.1 mm diam., hirtellum. *Calyx* tubo 0.3 mm alto, lobis 0.7 mm longis, extus hirtellis, intus glabris. *Corolla* luteola tubo 1.5 mm longo et 1 mm diam., lobis 0.6 mm longis. *Stamina* antheris 0.5 mm longis. *Stylus* 1.2 mm longus; *stylodium* floris masculi 0.3 mm longum. *Bacca* sicc. 3 mm diam.

Hab. terrae Borneënsis partem centralem.

Borneo. Western Division; Müller Mts, Liang Gagang, HALLIER 2590 BZ ♀ (typus), L (dupl. typi); Müller Mts, Bukit Tilung, alt. 700 m, H. WINKLER 1526 HBG ♀; Schwaner Mts, Bidang Menabai, alt. 600 m, id. 1103 HBG ♂.

As VALETON's description contains several inaccuracies, a new one is here given. The details of his Tab. X are not to be trusted either; both the structure of the ovary and the insertion of the hairs in the corolla being totally wrong.

The minute involucl at the base of the pedicel was unfortunately overlooked by WINKLER. For this reason his interpretation of the „cladanthy" can not be accepted: the flowers are in reality one-flowered inflorescences, and superposed inflorescences are in the *Urophyllum* group by no means uncommon, although they reach nowhere else in this group or even in the whole family such a striking development as here. The lateral shoots shown in his fig. 5 do not represent proliferations, and the involucl at their base does not represent a calyx: such involucls are in this family not rarely met with at the base of the shoots, and are of a cataphyllary nature.

2. *Stichianthus kinabaluensis* BREM. n. spec.; typus: J. et M. S. CLEMENS 32589 in herbario lugdunensi.

Habitus ignotus. *Rami* novelli dense ferrugineo-villosi, obtuse quadrangulares, sulcati, deinde olivaceo-pubescentes, 3—5 mm diam., indumentum diu retinentes. *Folia* petiolo dense villosa, primum ferrugineo, deinde olivaceo, 12—15 mm longo; lamina elliptica vel oblonga, 14—20 cm longa et 5.2—9.5 cm lata, basi acuta, subcoriacea, opaca, sicc. supra olivacea et subtus haud conspicue discolorata, primum utrimque ferrugineo-villosa, deinde margine, costa nervisque supra densius et inter nervos sparse adpresse pubescens, subtus costa nervisque dense adpresse pubescens, nervis utroque latere costae 18—20 subtus prominentibus, venulis subtus prominulis. *Stipulae* 3 cm longae et 3.5 mm latae, extus ad basin dense, apicem versus sparsius villosae. *Inflorescentiae* ut in *St. minutiflora*. *Flores* paulo majores. *Corolla* ignota, alba dicta. *Bacca* ut in specie altera.

Hab. terrae Borneënsis partem septentrionalem.

Borneo. British North Borneo; Mt Kinabalu, Penataran River, alt. 1200 m, J. et M. S. CLEMENS 32589 L ♀ (typus); ibidem, alt. 1350 m, id. 40222 L ♀.

This species comes very near to the preceding, but it is in all its parts somewhat more robust, and the leaves are provided with 18—20 instead of 10—14 nerve pairs.

Index specierum de quibus hic tractatum.

(Nomina hic accepta typo validiore impressa sunt)

- Axanthes corymbosa* BL., Bijdr. Fl. Ned. Ind., p. 1003 (1826);
Maschalocorymbus corymbosus (BL.) BREM. n. comb.
Axanthes tomentosa BL. ex DC. in Prodr. IV, p. 440 (1830); **Maschalocorymbus villosus** (WALL.) BREM.
Crobylanthe pellacalyx (RIDL.) BREM. n. comb.; *Urophyllum Pellacalyx* RIDL. in Journ. of Bot. LXX, p. 194 (1932).
Didymopogon sumatranum (RIDL.) BREM. n. comb.; *Urophyllum sumatranum* RIDL. in Journ. of Bot. LXX, p. 197 (1932).
Lasianthus tobingensis MIQ. in Ann. Mus. Bot. Lugd.-Bat. IV, p. 249 (1869); **Leucolophus tobingensis** (MIQ.) BREM. n. comb.
Lepidostoma polythyrsum BREM. n. spec.
Leucolophus gajoensis BREM. n. spec.
Leucolophus macranthus (RIDL.) BREM. n. comb.; *Urophyllum macranthum* RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 69 (1923).
Leucolophus tobingensis (MIQ.) BREM. n. comb.; *Lasianthus tobingensis* MIQ. in Ann. Mus. Bot. Lugd.-Bat. IV, p. 249 (1869).
Maschalocorymbus corymbosus (BL.) BREM. n. comb.; *Axanthes corymbosa* BL., Bijdr. Fl. Ned. Ind., p. 1003 (1826).
Maschalocorymbus grandifolius (RIDL.) BREM. n. comb.; *Urophyllum grandifolium* RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 68 (1923).
Maschalocorymbus villosus (WALL.) BREM. n. comb.; *Urophyllum villosum* WALL. in ROXB., Fl. Ind. II, p. 186 (1824).
Maschalocorymbus Yatesii (RIDL.) BREM. n. comb.; *Urophyllum Yatesii* RIDL. in Journ. of Bot. LXX, p. 220 (1932).
Pravinaria Endertii BREM. n. spec.
Pravinaria leucocarpa BREM. n. spec.
Rhaphidura Lowii (RIDL.) BREM. n. comb.; *Urophyllum Lowii* RIDL. in Journ. of Bot. LXX, p. 195 (1932).
Stichianthus minutiflorus VAL. in Bull. Jard. Bot. Buitenzorg Sér. 3 II, p. 349 (1920).
Stichianthus kinabaluensis BREM. n. spec.
Urophyllum corymbosum (BL.) KORTH. in Ned. Kruidk. Arch. II, 2, p. 194 (1851); **Maschalocorymbus corymbosus** (BL.) BREM.
Urophyllum grandifolium RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 68 (1923); **Maschalocorymbus grandifolius** (RIDL.) BREM. n. comb.
Urophyllum Lowii RIDL. in Journ. of Bot. LXX, p. 195 (1932);
Rhaphidura Lowii (RIDL.) BREM. n. comb.

- Urophyllum macranthum* RIDL. in Journ. Asiat. Soc., Mal. Branch I, p. 69 (1923); **Leucolophus macranthus** (RIDL.) BREM. n. comb.
- Urophyllum Pellacalyx* RIDL. in Journ. of Bot. LXX, p. 194 (1932); **Crobylanthe pellacalyx** (RIDL.) BREM. n. comb.
- Urophyllum sericeum* RIDL. in Journ. of Bot. LXX, p. 221 (1932) nomen confusum, p.p. **Maschalocorymbus corymbosus** (BL.) BREM.
- Urophyllum Shelfordii* RIDL. in Journ. of Bot. LXX, p. 197 (1932); **Crobylanthe pellacalyx** (RIDL.) BREM.
- Urophyllum sumatranum* RIDL. in Journ. of Bot. LXX, p. 197 (1932); **Didymopogon sumatranum** (RIDL.) BREM. n. comb.
- Urophyllum tomentosum* (BL. ex DC.) MIQ., Fl. Ind. Bat II, p. 224 (1857); **Maschalocorymbus villosus** (WALL.) BREM.
- Urophyllum villosum* WALL. in ROXB., Fl. Ind. II, p. 186 (1824); **Maschalocorymbus villosus** (WALL.) BREM. n. comb.
- Urophyllum Yatesii* RIDL. in Journ. of Bot. LXX, p. 220 (1932); **Maschalocorymbus Yatesii** (RIDL.) BREM. n. comb.
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